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REMARKS

Information Disclosure Statement:

The scanning of the information disclosure statements previously provided are acknowledged.

Claim Objections:

Claims 23 and 24 have been objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim. Claim 23 has been amended to remove the multiple dependent dependency by adding new claim 25 dependent from claim 22 and removing claim 22 dependency from claim 23. Claim 24 has been amended to remove dependency from claims 1-23 to dependency from claim 1 and 18 which are not multiple dependent claims.

35 USC § 112:

Claims 1-22 have been rejected under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

(A) Claims 1 and 2 has been amended to indicate that the component amounts are based on the total weight of the composition. Claims 15 and 16 are dependent from claim 1 and thus also encompass this amendment. Claim 18 has been amended to clarify the percent as total amount of elastomers and polyacetal.

(B) Claim 2 has been amended in accordance with the Examiner's suggestions.

(C) Claim 5 has been canceled making the objection to that claim moot.

(D) Claims 15, 16, 19, and 20 have been amended to remove the word(s) "(more/most) preferably" for clarity.

(E) Claim 18 has been amended to provide antecedent basis for the term "elastomer" and the phrase "the matrix resin" has been removed from this claim.

35 USC § 103:

The responses are numbered in accordance with the numbering of the September 29, 2004 office action for ease of reference.

Generally speaking, the present invention relates to compositions comprising a matrix material of polyacetal, mineral filler having an equivalent spherical diameter of about 0.05 to less than 10 micrometers, and an elastomer comprising thermoplastic polyurethane (TPU) or polyether polyester thermoplastic polymers. These compositions have improved toughness and improved internal lamination of polyacetal and elastomer compared to compositions without mineral filler [see page 12, lines 16-23 and the examples]. Support for the spherical diameter is found on page 4, lines 10-16 and page 12, lines 3-6 of the specification.

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8. Claims 1-3 and 7-13 have been rejected under 35 USC 103(a) as being unpatentable over Wissbrun et al. (US. 5,045,607) alone or in combination with Tajima et al (US Patent No. 5, 191, 011). Applicants disagree. Claim 3 has been canceled and its content incorporated into claims 1 and 2.

Wissbrun et al. discloses "moldable blends of a normally crystalline acetal polymer and a normally non-crystalline elastomeric copolymer of about 15 to 45 mol %, preferably about 25 to 35 mol % trioxane, about 55 to about 85 %, [...] of 1,3-dioxolane" [abstract]. Tajima et al. discloses a polyacetal composition prepared by "melt-blending a polyacetal, filler material, and thermoplastic acrylic resin.

The elastomers described by Wissbrun et al. are specific materials made from cyclic ethers (1,3-dioxolane and trioxane). Neither Wissbrun et al. nor Tajima et al. disclose the use of thermoplastic polyurethane or polyether polyester thermoplastic polymers in compositions comprising polyacetal and mineral filler wherein the mineral filler has an equivalent spherical diameter of about 0.05 to less than 10 micrometers as presently claimed. Thus, it would not have been obvious from the cited art to use TPUs or polyether polyester thermoplastic polymers with the mineral filler as in the present invention.

9. Claims 1-3 and 7-14 have been rejected under 35 USC § 103(a) as being unpatentable over Wissbrun et al. (US 5,045,607) alone, and further in combination with JP 01170641. Applicants disagree. Claim 3 has been canceled and its content incorporated into claims 1 and 2.

As mentioned above in number 8, neither Wissbrun et al. nor Tajima et al. disclose the use of a thermoplastic polyurethane or polyether polyester thermoplastic polymers in compositions comprising polyacetal and mineral filler wherein the mineral filler has an equivalent spherical diameter of about 0.05 to less than 10 micrometers as presently claimed in claim 1. Claims 2 and 7-14 have are dependent from claim 1 and thus differ from the prior art for the same reasons as claim 1.

35 USCS 102:

12. Claims 1-9, 12, and 13 have been rejected under 35 USC § 102(b) as anticipated by, or in the alternative, under 35 USC § 103(a) as obvious over Guest et al. (US 5,244,946). Applicant disagrees.

Guest et al. discloses thermoplastic blends comprising monovinylidene aromatic copolymer, acetal copolymer, and an elastomeric material such as a thermoplastic polyurethane [abstract]. Guest et al. does not disclose the use of mineral fillers having an equivalent spherical diameter of about 0.05 to less than 10 micrometers in polyacetal compositions comprising an elastomer as presently claimed in claim 1. thus claim 1, fails to

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meet the prima facie case of anticipation. Claims 2, 7-9, 12 and 13 are dependent from claim 1 and thus believed not anticipated for the same reasons as claim 1. Claims 3-6 have been canceled.

The improved toughness observed in the present invention is believed a result of the elastomers encapsulating the mineral particle and increasing the effective volume of the elastomers (see page 8, lines 4-11). The present invention as indicated on page 12, lines 3-12 and in the claims discloses the desired particle size which is not disclosed nor made obvious by the cited art. If the particle size is too small, it does not effectively increase the size of the elastomers and if it the particle size is too large, the overall properties are affected. Thus, it is not obvious in the prior art the correct particle size of the present invention to obtain the desired result.

35 USC § 103:

13. Claims 10, 11, and 14-17 have been rejected under 35 USC § 103(a) as being unpatentable over Guest et al. (US 5,244,946) in combination with Kielhorn-Bayer et al. (US 5,859,146). Claim 17 has been canceled making the objection to this claim moot.

Guest et al. discloses thermoplastic blends comprising monovinylidene aromatic copolymer, acetal copolymer, and an elastomeric material such as a thermoplastic polyurethane [abstract]. Kielhorn-Bayer et al. disclose thermoplastic molding material containing thermoplastic polymer, thermoplastic polyurethane, optional fibrous or particulate filler, and, optionally, other additives.

Neither Guest et al. nor Kielhorn-Bayer disclose the use of mineral fillers having an equivalent spherical diameter of about 0.05 to less than 10 micrometers in polyacetal compositions comprising an elastomer as presently claimed in the above dependent claims from claim 1.

As stated above, the improved toughness observed in the present invention is believed a result of the elastomers encapsulating the mineral particle and increasing the effective volume of the elastomers (see page 8, lines 4-11). The present invention as indicated on page 12, lines 3-12 and in the claims discloses the desired particle size which is not disclosed nor made obvious by the cited art. If the particle size is too small, it does not effectively increase the size of the elastomers and if it the particle size is too large, the overall properties are affected. Thus, it is not obvious in the prior art the correct particle size of the present invention to obtain the desired result.

35 USC § 102:

16. Claims 1-22 stand rejected under 35 USC § 102(b) as anticipated by, or in the alternative, under 35 USC § 103(a) as obvious over Takahashi et al. (US 4,692,480).

Applicant disagrees. Claims 3-6, and 17 have been canceled.

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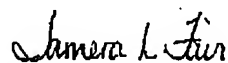
Takahashi et al. discloses a thermoplastic composition comprising a thermoplastic resin and a spherical, hollow filler, such as spherical glass filler [abstract; col. 2, lines 43-45]. The compositions of Takahashi are high in rigidity and light in weight [col. 1, line 51] whereas, the composition of the present invention has improved toughness.

Takahashi et al. does not disclose the use of thermoplastic polyurethane or polyether polyester thermoplastic polymers in compositions comprising polyacetal and mineral filler wherein the mineral filler has an equivalent spherical diameter of about 0.05 to less than 10 micrometers as presently claimed. Furthermore, there is no teaching in Takahashi et al. that the use of the mineral filler of the present invention in a polyacetal composition comprising the elastomers of the present invention will provide a composition having improved toughness and improved internal lamination between polyacetal and elastomers as in the present invention. For these reasons, the above mentioned claims are believed to not be anticipated nor made obvious by the cited art.

Please charge a one-month extension fee under 37 CFR 1.17(a) to respond to the Examiner's office action to Deposit Account No. 04-1928 (E.I. du Pont de Nemours and Company.) If, any additional fee is due in order to obtain consideration of this response, please charge that fee to the above identified account.

In view of the foregoing, allowance of the above-referenced application is respectfully requested.

Respectfully submitted,



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